Pretreatment 101

Overview of Local Limits

20th Annual EPA Region 6 Pretreatment Workshop
April 14, 2004

Rebecca L. Villalba
Storm Water & Pretreatment Team
Water Quality Division
Texas Commission On Environmental Quality

Overview of Pretreatment Program

Code of Federal Regulations (CFR)

Goals and Objectives

Clean Water Act

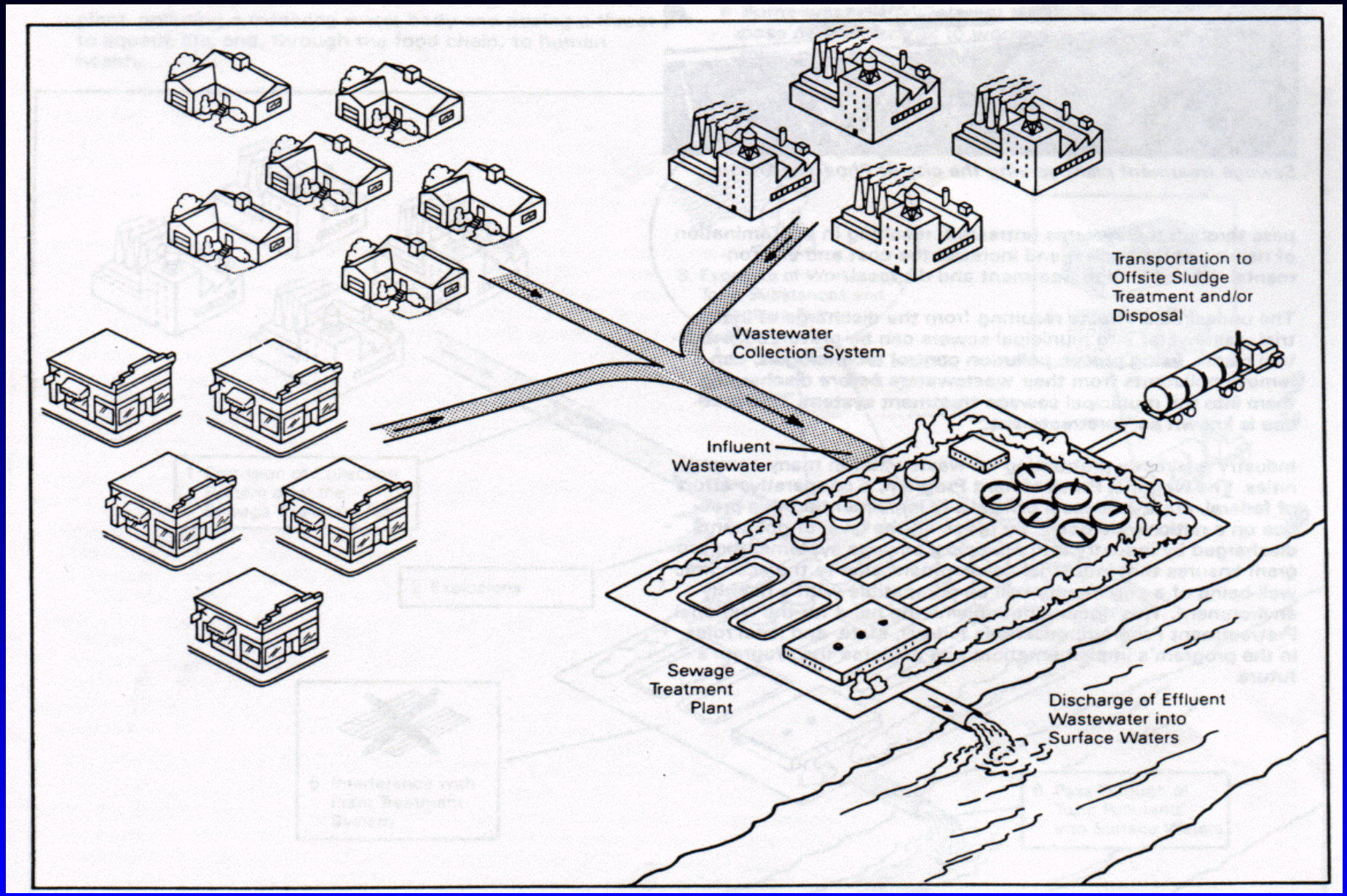
- Protect human health and the environment
- Protect for fishable and swimmable uses of the water bodies
- Prohibit the discharge of toxic materials in toxic amounts

Goals and Objectives

National Pretreatment Program

- Prevent Pass Through
- Prevent Interference
- Improve/Encourage Recycling/Reuse
- Protect Worker Health and Safety

Wastewater Collection and Treatment



Pretreatment Standards to Achieve Objectives

- General and Specific Prohibited Discharges (*national and local*)
- Categorical Pretreatment Standards *(national)*
- Local Limits (*developed by each Control Authority (CA) for site-specific reasons*)

Summary of Standards

	General and Specific Prohibitions	Categorical Pretreatment Standards	Local Limits
Development	Established at the Federal level	Established at the Federal level	Developed by Control Authorities
Reference	40 CFR 403.5(a) & (b)	40 CFR Parts 405-471	Requirements
Applicability	All IUs	CIUs	Commonly all IUs or all SIUs, but depends on allocation method used when developing limits.
Purpose	Provide for general protection of the POTW. May be superseded by more stringent categorical pretreatment standards or local limits.	Minimum standards based on available treatment technology and pollution prevention measures for controlling nonconventional and toxic pollutants that may cause pass through, interference, etc. at the POTW. May be superseded by more stringent local limits.	Provide site specific protection for a POTW and its receiving waters. May be superseded by more stringent categorical standards.

All standards are considered pretreatment standards for the purpose of section 307(d) of the Clean Water Act. A POTW is responsible for identifying standard(s) applicable to each industrial user and applying the most stringent requirements where multiple provisions exist. Compliance with imposed standards can be achieved through implementation of best management practices, development of a pollution prevention program, and/or installation of pretreatment.

Requirement for Local Limits

40 CFR §403.5(c)

- All publicly owned treatment works (POTWs) required to have an approved pretreatment program shall develop and enforce local limits
- Each POTW shall continue to develop local limits as necessary and effectively enforce such limits
- All other POTWs with existing pass through or interference problems must develop and enforce local limits

Pretreatment Standards

40 CFR §403.5(d)

Local limits developed by a POTW shall be deemed pretreatment standards for the purposes of the Clean Water Act

Pretreatment Program Requirements

40 CFR §403.8(f)- Legal Authority and Procedures

Permits must contain effluent limits and self-monitoring requirements based on applicable:

- general pretreatment standards,
- categorical pretreatment standards,
- local limits, and
- State and local law

Pretreatment Program Requirements

40 CFR §403.8(f)- Legal Authority and Procedures

- Carry out inspections, surveillance, and monitoring procedures to determine compliance with pretreatment standards and requirements
- These activities must be performed independent of the information supplied by industrial users (IUs)

Pretreatment Program Requirements

40 CFR §403.8(f)- Legal Authority and Procedures

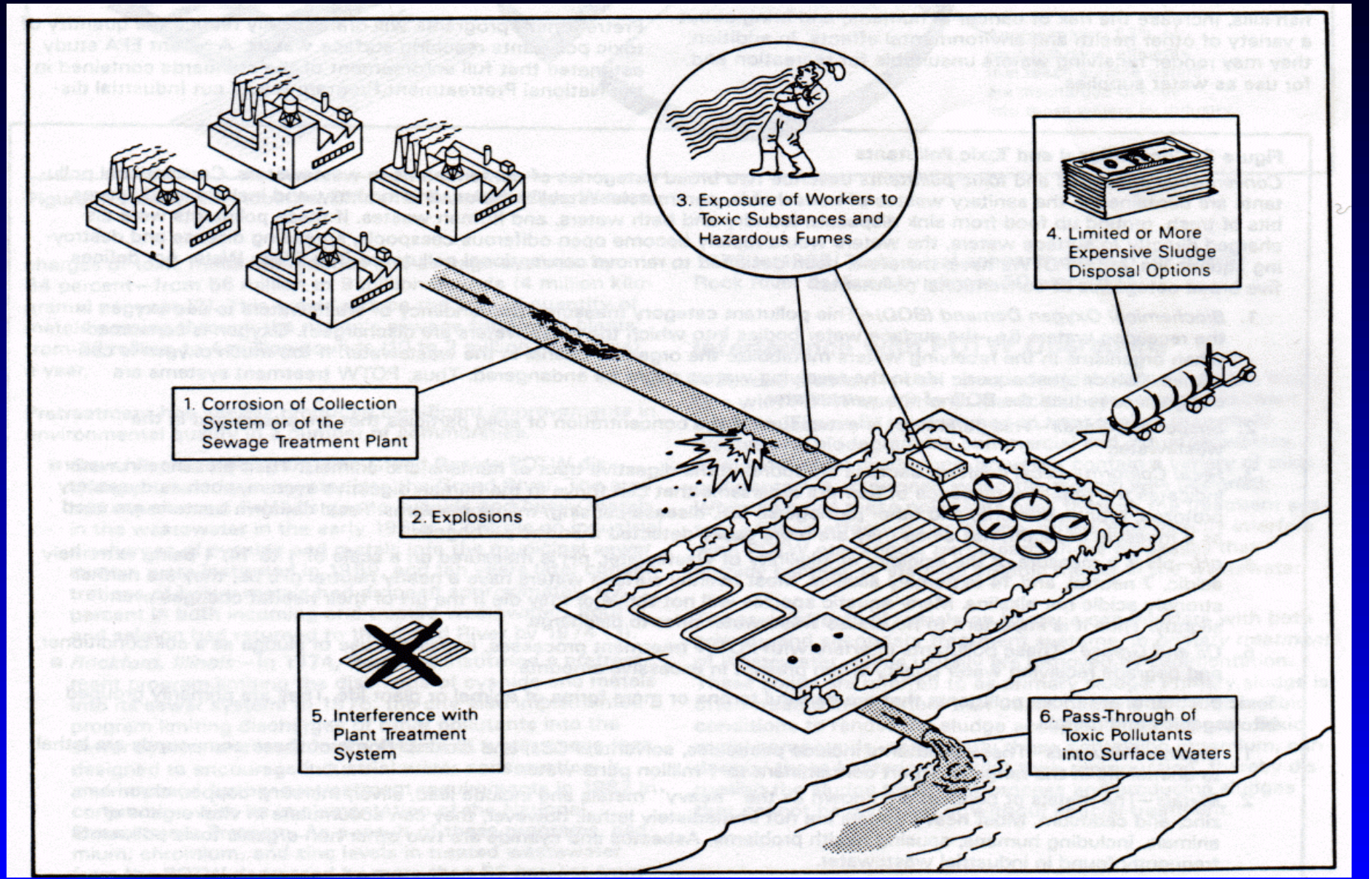
- Identify the character and volume of pollutants contributed by the Ius
- Randomly sample and analyze the effluent from IUs in order to identify noncompliance with pretreatment standards
- Inspect and sample the effluent from each significant industrial user (SIU) at least once per year

Pretreatment Program Requirements

40 CFR §403.8(f)(4)- Local Limits

Develop local limits as required in
40 CFR §403.5(c)(1)
or
demonstrate that they are not necessary

Problems that may occur when industrial wastewaters are discharged into POTWs



Purposes of Local Limits

Developed to:

- Protect receiving stream
- Correct existing problems
- Prevent potential problems
- Increase sludge disposal options
- Protect POTW and personnel
- Increase efficiency
- Cut operation and maintenance costs

Need for Local Limits

- Categorical Pretreatment Standards:
  - do not address all contributed pollutants
  - are not applied to non-categorical SIUs
  - may not adequately protect the:
    - wastewater treatment plant
    - collection system
    - sludge
    - personnel
    - receiving water

General Characteristics of Categorical Pretreatment Standards and Local Limits

Characteristics	Categorical Pretreatment Standards	Local Limits
Basis	Technology (BAT)*	Technical Evaluation of POTW
Type of Limitations	Production/Concentration	Concentration
Objective	Baseline Requirements	Local Environmental Objectives
Units	Daily Maximum/Maximum Monthly Average	Instantaneous/Daily Maximum or Any Other Units
Point of Application	End of Regulated Process	End of Pipe

***Best Available Technology**

Types of Local Limits

- Numeric limitations for specific pollutants
  - Specific concentration or mass based limits that apply to the end-of-pipe
- Other mechanisms to regulate industries, if needed, include:
  - Additional prohibited discharges
  - Management practices
  - Spill plans

Developing Technically Based Local Limits

Overview of Process

- ✓ Collect data
- ✓ Identify pollutants of concern
- ✓ Develop maximum allowable headworks loadings (MAHLs)
- ✓ Determine maximum allowable industrial loading (MAIL)
- ✓ Allocate allowable industrial loading through technically based local limits (TBLLs)

Developing Technically Based Local Limits

Overview of Process

- Submit to Approval Authority for review
- Adopt into legal authority (*i.e.* Ordinance)
- Submit to Approval Authority for approval
- Formal public notification

Overview of Methodology for Developing Local Limits

Step 1: Collect Data for Local Limits Development

Step 2: Develop Maximum Allowable Headworks Loadings

Step 3: Determine Maximum Allowable Industrial Loading

Step 4: Allocate Allowable Industrial Loading

Step 1: Collecting Data for Local Limits Development

Identify Pollutants of Concern

↓

Detemine Applicable Environmental Criteria

↓

Collect Site Specific Data from:

- **POTW**
- **Industrial Users**
- **Domestic/Background Sources**

↓

Conduct Headworks Analysis

Determining Pollutants of Concern

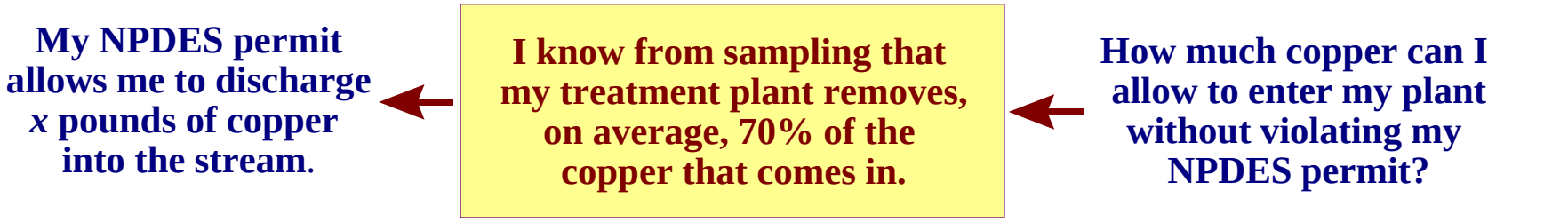
- Criteria
  - EPA and State requirements
  - Ten pollutants (Cd, Cr, Cu, Pb, Ni, Zn, As, CN, Ag, Hg)
  - NPDES permit limits
  - Applicable Water Quality Standards
  - Historical problems (*i.e.* process inhibition)
  - Sludge disposal considerations
  - Worker health and safety considerations
  - Collection system considerations
  - Other (RCRA, CERCLA, Drinking Water Standards)

Removal Efficiencies

- Determine for:
  - Entire POTW
  - Primary treatment operations
  - Secondary treatment operations
- Consider hydraulic retention time during sampling
- Influent samples should be obtained upstream from recirculating flows
- If site-specific data cannot be obtained, literature values are available

Step 2: Develop Maximum Allowable Headworks Loadings (MAHLs)

- Conceptually, calculating MAHLs is an exercise in back calculation



Development of Maximum Allowable Headworks Loadings

- MAHLs are typically based on the most stringent of:
  - NPDES pollutant discharge permit limitations
  - Water Quality Standards or criteria
  - Treatment plant process inhibition levels/ operational problems
  - Sludge disposal standards

Step 3: Determine Maximum Allowable Industrial Loading

- Subtract domestic/background contributions
- Subtract safety/growth factors
  - 5 to 20%

Step 4: Allocate Allowable Industrial Loading to Industrial Users

- Four Allocation Methods:
  - Uniform concentration method
  - Industrial contributory flow method
  - Mass proportion method
  - Selected industrial reduction method

Local Limits Should...

- Be reasonable
- Be at or above detection limits
- If below detection limits, must adopt calculated value, but measure compliance at the minimum quantification level (MQL)
- Prevent IUs from discharging hazardous waste

Technically Based Local Limits

Implementation and Enforcement

Implementation and Enforcement of TBLLs

Federal Guidance Documents

- Explain the intent of the federal regulations and provide details to the control authority (CA) to:
  - Develop local limits
  - Implement local limits
  - Enforce local limits

Compliance Monitoring of TBLLs

Federal Guidance Documents

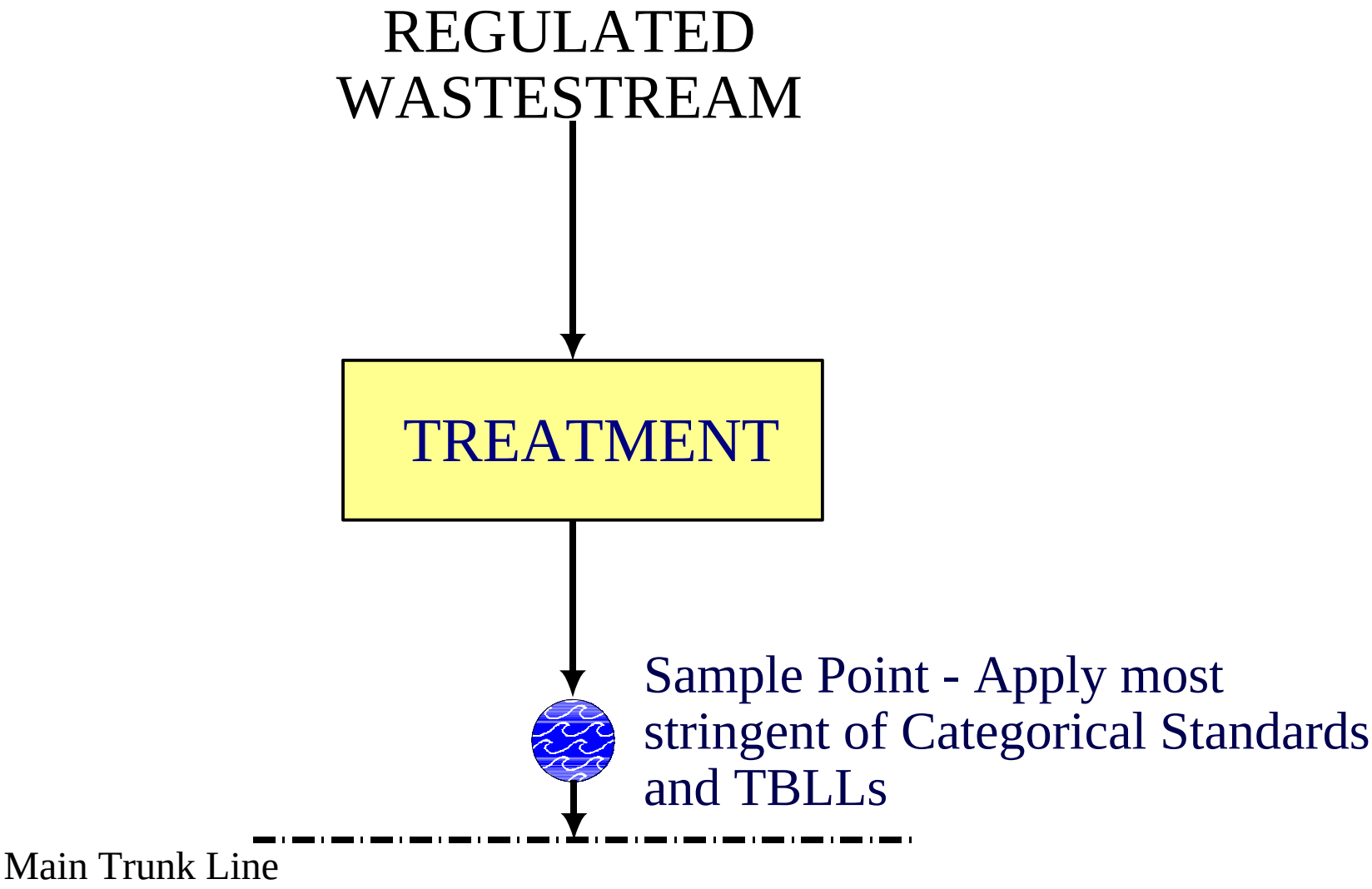
- The goals of the CA's activities are to:
- Ensure industrial compliance with federal categorical pretreatment standards
- Independently ensure that applicable pretreatment standards (including local limits) are being met by affected IUs
- Ensure industrial compliance with local limits, legal authorities and IU permit provisions

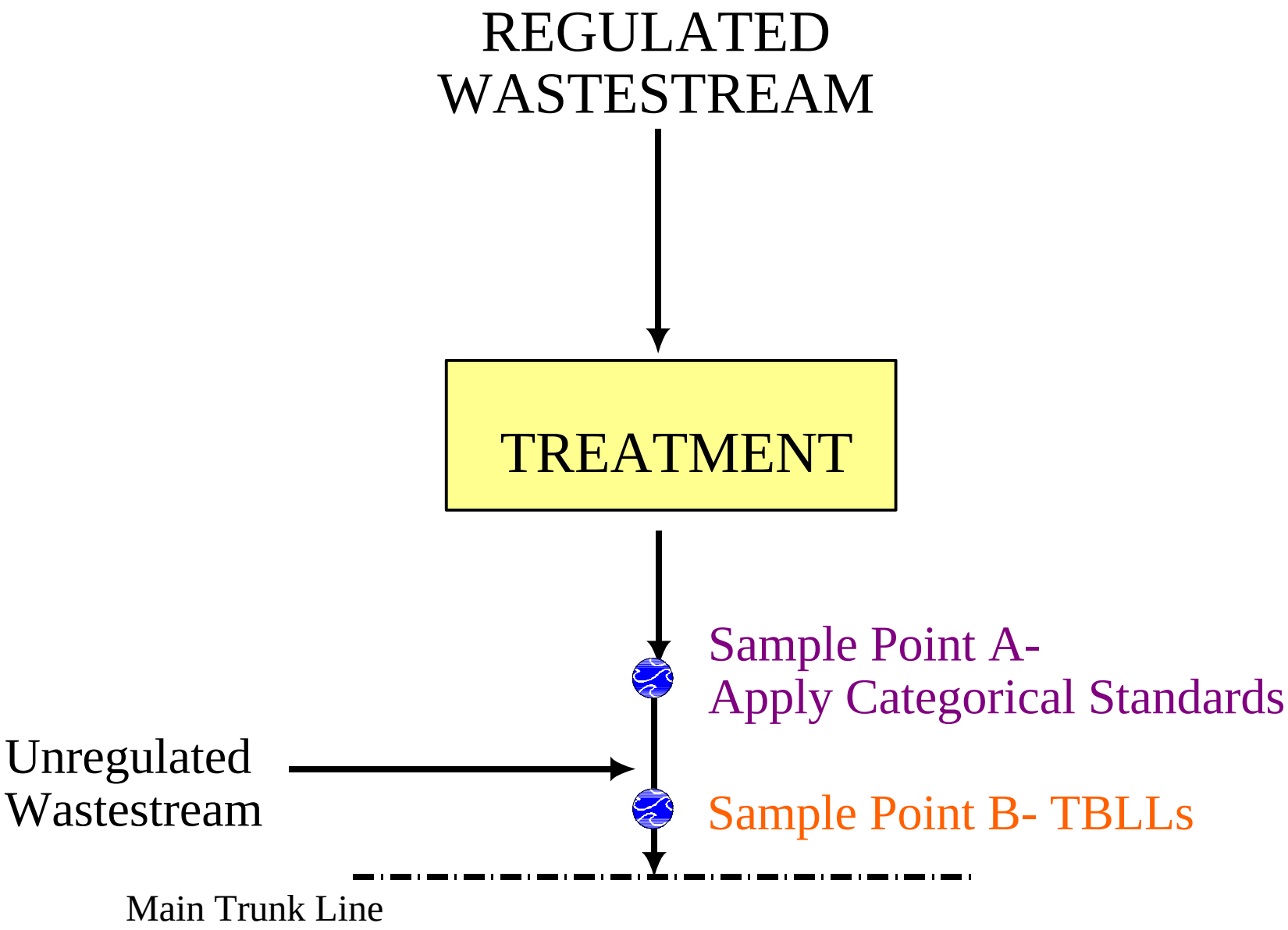
Compliance Monitoring of TBLLs

Federal Guidance Documents

The goals of the CA's activities are to:

- Ensure that required federal and local self-monitoring and reporting requirements are met
- Independently verify that self-monitoring results reported by IUs are representative of the pollutant concentrations in wastewater from these users
- Maintain accurate knowledge of industrial processes and their potential to impact the POTW


REGULATED
WASTESTREAM
TREATMENT
Sample Point - Apply most stringent of Categorical Standards and TBLLs
Main Trunk Line


REGULATED
WASTESTREAM
TREATMENT
Sample Point A-
Apply Categorical Standards
Unregulated
Wastestream
Sample Point B- TBLLs
Main Trunk Line

Reasons to Revise TBLLs

- Existing IU alters or expands their discharge
- New wastes are accepted
- IU terminates discharge
- POTW undergoes renovation or expansion
- Change in sludge disposal methods or NPDES permit
- Cannot demonstrate that limits provide adequate protection
- Additional data becomes available

TBLLs Reassessment

- 40 CFR §122.21(j)(4)
- Written evaluation required within 60 days of NPDES permit issuance
- Fill out *Reassessment of TBLLs* form

TBLLs Guidance

- EPA's *Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program* (December 1987)
- EPA's *Supplemental Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program* (May 1991)
- EPA's *Guidance to Protect POTW Workers from Toxic and Reactive Gases and Vapors* (June 1992)
- EPA's Region 6-Technically Based Local Limits Development Guidance Document (July 28, 1987)